

REMARKS

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action of July 13, 2007.

Reconsideration of the Application is requested.

The Office Action

Claims 1-5, 7, 11-15, 19-21, 23, 25-27 and 29 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lo (U.S. Patent No. 6,987,958) in view of Pallonen (U.S. Patent No. 6,408,169).

Claims 6, 22 and 28 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Lo (U.S. Patent No. 6,987,958) and Pallonen (U.S. Patent No. 6,408,169) and further in view of Evans (U.S. 2003/0083016).

Claims 8, 9 and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lo (U.S. Patent No. 6,987,958) and Pallonen (U.S. Patent No. 6,408,169) and further in view of Nakamura (U.S. Patent No. 6,243,563).

Claims 18, 24 and 30 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lo (U.S. Patent No. 6,987,958) and Pallonen (U.S. Patent No. 6,408,169) in view of Ohkuba (U.S. Patent No. 2003/0003937).

Claims 35-37 do not appear to be examined. Examination and allowance of claims 35-37 are respectfully requested.

Claims 17 and 31-34 have been cancelled.

Claims 1-2, 4-5, 7-16, 18-20, 22, 24-26, 28, 30 and 35-37 remain in the application.

Interview Summary

Applicants gratefully acknowledge the opportunity given by Examiners Urban and Haroon to meet on August 7, 2007. At the interview, Examiners and Applicants discussed the present application and cited prior art, Lo (U.S. Patent No. 6,987,958), Pallonen (U.S. Patent No. 6,408,169), Nakamura (U.S. Patent No. 6,243,563) and Evans (U.S. Patent Publication 2003/0083016). As a result of the interview, it is the Applicants' understanding that claims 19 and 25 amended to define subsets of antennas would overcome the cited prior art. It is further the Applicants understanding that

claims 1 and 11 amended to include the language "third and first sub-switches coupled in series" would overcome the cited prior art.

Claims Distinguish over Cited Prior Art

Claim 1 calls for among other elements: a first sub-switch, a second sub-switch, and a third sub-switch, operationally coupled in series with the first sub-switch.

Lo couples N element antenna array to an N-by-N beamformer which creates N beams. (Col. 3, lines 7-14.) E.g., multiple outputs of the antennas are combined into a plurality of output beams. Each output beam is connected to an input of a switch. An output of each switch is connected to a receiver. Lo does not describe coupling of each discrete, physically separate, single antenna to an individual receiver to create a distinct physical signal path from the antenna to the receiver. Neither does Lo describe coupling each receiver to individual antennas different from one another, as recited in claim 1.

Further, Applicants carefully reviewed Lo and did not find a single mentioning of a transmitter chain separate from the receiver chain. Instead, Lo describes quite transparently a transceiver chain which is switchable between reception and transmission modes. (Element 215). The transceiver chain is always connected to the same dedicated switch. Therefore, Lo does not describe or suggest (1) using a dedicated transmitter chain and (2) connecting the transmitter chain to an individual antenna selected from a plurality of antennas as recited in claim 1. If the Examiner maintains his position that Lo describes a dedicated and isolated transmitter chain, Applicants respectfully request the Examiner to point out where exactly in Lo a dedicated and isolated transmitter chain is described.

Pallonen describes connecting two antennas selected from four antennas to two receiver chains. Pallonen does not describe a switch structure.

The Proposed Combination Of Lo And Pallonen Will Change The Principle Of Operation Of Lo

The Examiner suggests combining Pallonen with Lo. However, the proposed modification of Lo with Pallonen will change the principle of operation of Lo. If the proposed modification or

combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. MPEP 2143.01, citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

It is apparent that the essence of Lo is a beamformer which is to combine antenna outputs. According to the Examiner, the proposed modification of Lo with Pallonen will eliminate the use of a beamformer. E.g., the output of each individual antenna will be connected to an individual switch and, subsequently, to an individual receiver. Therefore, because Lo-Pallonen combination will change the principle of operation of Lo, the teachings of Lo and Pallonen do not render claim 1 obvious.

**The Proposed Combination Of Lo And Pallonen Will Change The Principle
Of Operation Of Pallonen**

The proposed modification of Lo with Pallonen will also change the principle of operation of Pallonen. If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. MPEP 2143.01, citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). In addition, the proposed modification of Lo with Pallonen will make Pallonen unsatisfactory for its intended purpose. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. MPEP 2143.01, citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Indeed, each individual antenna of Pallonen would be connected to an individual switch of Lo; an output of each switch will be connected to an individual receiver. More specifically, the strongest antenna will be connected to a dedicated switch and the rest of the antennas each will be connected to one of the switches. Outputs of all antennas will be provided to the combiner. Rather to the contrary, Pallonen teaches a diversity reception by selecting two best antennas out of four antennas. E.g., outputs of the two best antennas are provided to the combiner. Thus, Lo-Pallonen combination clearly precludes a diversity reception to which Pallonen is directed. Therefore, because Lo-Pallonen combination will change the principle of operation of Pallonen, the teachings of Lo and Pallonen do not render claim 1 obvious.

Moreover, because the proposed modification will make Pallonen unsatisfactory for its intended purpose, there is no suggestion or motivation for one skilled in the art, and more importantly, exists in Lo and Pallonen themselves to combine the references.

Nakamura Couples Three Switches

Nakamura describes selecting a diversity antenna by coupling three switches. Fig. 4 depicts selecting one out of three antennas for Rx, and one out of two antennas for Tx by coupling three switches. (Fig. 4.) Further, Nakamura describes selecting one out of two antennas for Rx and one out of two antennas for Tx by coupling three switches. (Fig. 5). A signal in Nakamura, as shown in Figs. 4 and 5), goes through all three switches during reception. Claim 1 calls for only two switches to be coupled in series during reception.

Regarding Fig. 2, a reception dedicated switch 3 is used for reception. A common switch 4 is used for reception and transmission. During reception, the common antenna is connected via switches 3 and 4 to the reception line. During transmission, the common antenna is connected to the transmission line. To the contrary, claim 1 calls for first and third sub-switches to be coupled in series during transmission.

In conclusion, none of Lo, Pallonen or Nakamura, taken singularly or in combination, teaches or suggests the following features recited in claim 1:

1. N Multiple antennas, from which individual antennas are selected to connect to each of multiple individual receiver chains and the transmitter chain.
2. Wherein the transmitter chain being separate from the receiver chains.
3. Wherein the switching is done by a single switch structure.
4. Wherein the switch structure includes three sub-switches.
5. Wherein two sub-switches of the switch structure are cascaded in series and one sub-switch is parallel to the two cascaded switches.

It is therefore respectfully submitted that **claim 1 and dependent claims 2, 4-5, and 7-10** distinguish patentably and unobviously over Lo, Pallonen and Nakamura.

In addition to its relationship to Claim 1, **Claim 8** calls for among other elements: during reception, first and second signal paths are created, which first signal path includes only the first and third sub-switches and the second signal path includes only the second sub-switch, and, during the transmission, a third signal path is created which third signal path includes only the first and third sub-switches. **Nakamura** describes selecting a diversity antenna by coupling three switches. Signals from antennas 2 and 2N pass through switches 20, 4, and 3 to reach the receiving portion. (Fig. 4.) Further, Nakamura describes selecting one out of two antennas for Rx and one out of two antennas for Tx by coupling three switches. (Fig. 5). Signals from the antenna go through switches 22, 4 and 3 to reach the receiving portion. Therefore, a signal in Nakamura, as shown in Figs. 4 and 5, goes through all three switches during reception.

Regarding Fig. 2, to follow up on Applicants discussion with Examiner Haroon, a reception dedicated switch 3 is used for reception. A common switch 4 is used for reception and transmission. During reception, the common antenna is connected via switches 3 and 4 to the reception line. During transmission, the common antenna is connected to the transmission line. Therefore in Nakamura's embodiment of FIG. 2, the signal goes through two switches during reception and one switch during transmission. A third signal path is not described anywhere in Nakamura.

It is therefore respectfully submitted that **claim 8** distinguishes patentably and unobviously over Lo, Pallonen and Nakamura, taken singularly or in combination.

Claim 11 calls for among other elements: a first sub-switch, a second sub-switch, and a third sub-switch, operationally coupled in series with the first sub-switch.

The arguments above regarding claim 1 are equally applicable here. It is therefore respectfully submitted that **claim 11 and dependent claims 12-16 and 18** distinguish patentably and unobviously over Lo, Pallonen and Nakamura, taken singularly or in combination.

Claim 19 calls for among other elements: determining first and second subsets of antennas from N antennas.

Initially, Applicants submit that the arguments regarding Lo and Pallonen in relation to claim 1, are equally applicable here. In addition, to follow up on the Applicants discussion of Evans with Examiner Haroon, **Evans** describes connecting reception antennas to Rx chains at the receiving

station and transmission antennas to Tx chains at the separated transmitting station. (Para. 15 and 16.) More particularly, switch 42 is fixed to always select an antenna from reception antennas RA1, RA2 and RA3. Switch 44 is fixed to always select an antenna from reception antennas RA2, RA3 and RA4. Switch 32 is fixed to always select an antenna from transmission antennas TA1, TA2 and TA3. Switch 34 is fixed to always select an antenna from transmission antennas TA2, TA3 and TA4. To the contrary, claim 19 calls for determination of first and second subsets of antennas, the subsets being selected from all of the antennas and might have a variable number of antennas. Thus, a particular receiver may receive reception signal from only the determined subset of antennas. Moreover, Claim 19 calls for connecting antennas to either receiving or transmitting chains using the same integrated switch structure and for selecting a transmission antenna from all of the antennas which Evans is lacking.

It is therefore respectfully submitted that **claim 19 and dependent claims 20, 22 and 24** distinguish patentably and unobviously over Lo, Pallonen and Evans, taken singularly or in combination.

Claim 25 calls for among other elements: determining first and second subsets of antennas from N antennas. The arguments above regarding claims 1 and 19 are equally applicable here. It is therefore respectfully submitted that **claim 25 and dependent claims 26, 28 and 30** distinguish patentably and unobviously over Lo, Pallonen and Evans, taken singularly or in combination.

Claims 35-37 do not appear to be examined. The examination and allowance of claims 35-37 is respectfully requested.

CONCLUSION

For at least the reasons detailed above, it is submitted that all claims remaining in the application (**Claims 1-2, 4-5, 7-16, 18-20, 22, 24-26, 28, 30 and 35-37**) are in condition for allowance. The foregoing comments do not require unnecessary additional search or examination.

No additional fee is believed to be due for this Amendment. However, the undersigned attorney of record hereby authorizes charging of any necessary fees, other than the issue fee, to the Deposit Account No. 22-0261.

If the Examiner finds a personal contact advantageous to the disposition of this case, the Examiner is invited to call Marina Zalevsky, at telephone number 202-344-4975.

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Respectfully submitted,

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